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USE OF HYDROMECHANICS FOR OVERBURDEN REMOVAL IN SOVIET FAR EAST OPEN-PIT MINING

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In constructing coal pits for open-pit mining, removal of the overburden is often carried out by a hydromechanical method which is almost twice as cheap as the use of excavators combined with transport of the waste rock to the pit banks by standard gauge railway.

In 1948, in conformity with the planned organization of work approved by the Gostekhnika USSR, the Vzryvpromstroy Trust carried out an experiment in removing the overburden in the construction of the Raychikhinsk coal pit by a method combining hydromechanics with mechanical breaking up of the ground. The method had been proposed by Professor Kholin and is described as follows:

A preliminary pit is first cleared at the place of operations and a mud pump, a pulp pipe, and hydromonitors are set up at the bottom of this pit. A bulldozer operates at the upper edge of the pit, removing layer after layer of waste rock to a thickness of 10 to 15 centimeters. The rock is dumped into the pit where it is exposed to the jet action of the hydromonitors. When pulp of the proper consistency has been obtained, it is directed to the sump of the mud pump and carried to the dumping grounds by the pulp pipe.

A special section was set aside for experimentation according to the described method. The overburden consisted of vegetation for 0.5 meter, moderately compact, red argillaceous clay for 6 to 7.5 meters, and white, compact clay for 3.4 to 4.0 meters. The average thickness of the overburden was 11 meters.

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The table following gives data on the 8NDV pumping station in operation at the experimental section.

Date	Machine Hr Worked	Pressure at Pumping Station (atm)	Pressure at Nozzle of Hydromonitor (atm)	Consumption of Electric Power (kwh)	Cu m Processed
Oct					
9	1.0	9.0	3.0	260	120
10	18.0	9.0	3.0	3,120	5,840
11	6.75	9.0	2.5-3.0	1,774	325
12	13.0	9.5	3-3.5	3,380	1,191
13	9.0	9.0	3.0	assembly work	assembly work
14	10.25	9.0	2.5-3.0	2,665	528
15	20.0	9.0	2.5-3.0	5,200	1,399
16	22.0	9.0	2.5-3.0	5,720	1,680
17	20.0	9.0	2.5-3.0	5,200	1,444
18	17.0	9.0	2.5-3.0	4,420	1,430
19	20.0	9-10.0	3.5-4.0	5,200	2,360
20	18.0	9-10.0	2.5-3.0	4,670	1,318
21	21.0	9.0	2.5-3.0	5,460	1,333
22	18.0	9.0	3.0	4,680	1,080
Total	214.0			51,749	15,048 [sic]

Data on the operations of the S-80 bulldozer utilized in operations at the experimental section is given in the following table:

Date	Labor Productivity (hr) Total	Net Working Time	Stops for Technical Reasons	Cu m per Shift	Cu m per Hr
Sep					
24	8	2	6	132	66.0
25	8	4	4	280	70.0
27	8	5	3	360	72.0
28	8	7	1	540	77.0
29	8	7	1	570	81.0
30	8	7	1	550	78.5
Oct					
4	8	6.5	1.5	700	915.0 [sic]
5	8	7.25	0.75	680	7.0 [sic]
6	8	7.25	0.75	685	98.0
7	8	7.0	1.0	728	104.0
8	8	7.0	1.0	710	101.5
9	11	1.0	10.0	120	120.0
10	21	9.5	11.5	840	788.4 [sic]
11	11	7.0	4.0	372	56.0 [sic]
12	18	14.75	3.25	1,175	80.0 [sic]
13	12	9.0	3.0	918	102.0
14	12	10.0	2.0	530	53.0
15	22	18.75	3.25	1,372	69.4 [sic]
16	23	20.75	2.25	1,682	81.5 [sic]

Labor Productivity (hr)

Date	Total	Net Working Time	Stops for Technical Reasons	Cu m per Shift	Cu m per Hr
17	22	18.0	4.0	1,278	71.0
18	23	16.5	6.5	1,427	86.5 [sic]
19	23	19.25	3.75	2,304	120.0 [sic]
20	23	17.5	5.5	1,310	75.0 [sic]
21	23	20.5	2.5	1,334	65.0 [sic]
22	23	18.0	5.0	1,071	59.5
Total	356 [sic]	268.5 [sic]	87.5 [sic]	22,013 [sic]	83.7

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